

# INSTALLATION AND OPERATION INSTRUCTIONS

## TVT - 10 TELEVISION TRANSLATOR

ANDERSON SCIENTIFIC  
TRANSLATOR ORIGINATORS

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Please read this manual before operating your translator. This equipment must not be powered before the R.F. output terminal is connected to a matched load.

The TVT-10 is the world's most efficient television translator. It was designed by Keith Anderson, the first manufacturer of translators, and inventor of solid state T.V. and F.M. translators.

### ANTENNA INSTALLATION

The receiving and transmitting antennas should be heavy duty single channel yagis. They may be stacked horizontally or vertically for increased directivity or power.

The minimum received signal should be 200 microvolts at 75 ohms. More may be required in high noise areas.


Ideal input to the TVT-10 is 1000 to 2000 microvolts. When the unit is operated with more than a 5000 microvolt signal source, an external attenuator should be installed at the input connector. Adjust the attenuator for 2000 microvolt peak visual at 75 ohms.

If no signal strength meter is available, switch in attenuation until a small amount of noise appears in the translated picture, then switch out 20 dB.

If the signal is less than 200 microvolts or subject to fading, add more receiving antennas and order our LNP single channel antenna mounted preamp.

The transmitting antenna may be single or stacked. A five element yagi will have about 50 degree beam width between half power radials. Ten element antennas are about 30 degree beam width. By "skewing" a stack to aim in different directions the beam width is increased with a decrease in forward power.

It is good practice to separate receiving and transmitting antennas by at least 50 feet. The output antenna should be located to the side (off the ends of the elements) of the receiving antenna. This reduces feedback to the receiving amplifier.



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The TVT-10 is matched best to a 75 ohm output load. It may be operated at reduced efficiency into a 50 ohm system. We can supply cable transformers to match to 50 ohm input or output, including any required adapter from the F connectors to your cable connectors.

#### OTHER SIGNAL SOURCES

The TVT-10 may be used as an originating transmitter by connecting the input to the R.F. output of a video tape recorder, or to the output of a modulator. The modulator video source may be a satellite receiver, camera, or microwave receiver. This type of installation may not be licensed in all countries. Check before ordering.

When the input signal is from a modulator or video tape recorder, be sure to install an R.F. attenuator to adjust the input to two millivolts peak visual.

#### WEATHER PROOFING

The best shelter for your translator would be a clean, temperature controlled building. Since these are not available at most sites, there are several alternatives. Discarded refrigerators have worked well at many locations because of their insulation, easy access, and ease of transport. They are totally weather proof and easily locked.

All antennas and translators should be grounded to a long copper rod driven into moist earth. It may be necessary to run a long ground wire to find a suitable grounding location.

Battery powered units will practically never be lightning damaged if good grounding techniques are observed. A.C. powered units may suffer lightning damage to the separate A.C. supply. If no spare power supply is on hand, power the translator with a 12.6 volt battery while the supply is repaired.





### POWERING

The power source should not be connected to the translator before the antennas are installed and connected. When there is no load for the R.F. output the final transistor may be overheated and damaged.

The TVT-10 may be operated from a 12.6 volt lead-acid battery or a 13.8 volt two amp A.C. to D.C. regulated supply. There are two sets of power input banana jacks at the rear of the TVT-10. The 13.8 volt input circuit has a blocking diode which will prevent damage in the event polarity of the power source is accidentally reversed. (Reversing the polarity into the 12 volt terminals will blow the two amp fuse and may damage the input filter capacitor).

The blocking diode also permits use of a 12.6 volt battery in conjunction with a 13.8 volt charging source. This permits operation during A.C. power outage with automatic recharge when A.C. power is restored. Solar or wind source may also be used to maintain the battery charge, but they should be regulated at no more than 14 volt output. This protects the translator in case the battery terminals open due to corrosion or water loss.

### SWITCHES AND CONTROLS

The TVT-10 fuse is mounted on the front of the cabinet. It must always be replaced with only a fast blow A.G.C. type two amp fuse. Never use higher value or slow blow types. If the fuse is blown there is probably a power source problem, such as reverse connections or over voltage.

The off-on switch is coded red. It is on in the upward position. The speak/mute switch is coded green. It is normally operated in the down position to conform with regulation and conserve supply power while no input signal is received.





The power output control is positioned below the on-off switch. The control ranges from two watts minimum to 10 watts maximum (fully clockwise). It is red lined at the ideal operating level.

The gain control is located below the fuse. It is normally adjusted fully clockwise. In that position the translator automatically switches off the final two stages when the input signal falls below 25 microvolts.

In an area of good input signal, but unusually high noise, reduction of the gain control will increase the muting level to as high as 250 microvolts. This prevents retransmitting amplified noise only.

#### METERING

Seven values are indicated by the rotary switch and 50 microamp meter on the front panel.

<u>POSITION</u>	<u>METERS</u>	<u>10 WATT READING</u>	<u>MUTED READING</u>
V	D.C. VOLTAGE	13 VOLTS	13
P	POWER OUTPUT	RED DOT	0
F	FINAL CURRENT	9= .9A.	0
D	DIODE CURRENT	45-50 MA.	0
A	AMPLIFIER CURRENT	32-64 MA.	32
C	CONVERTER CURRENT	15-20 MA.	15
R	RECEIVER CURRENT	10-15 MA.	10

Receiver and converter currents increase with increased signal input A.G.C. action.

All readings plus or minus ten percent.

Position 8, next to R, is factory test of muting action. It may be used to home in antennas with weak or attenuated inputs. (Turn receiving antenna for highest reading.)





### CIRCUIT DESCRIPTION

The channel amplifiers and converters are in four separate shielded enclosures, interconnected by three 75 ohm cables.

RECEIVER The input channel is preselected and amplified up to 36 dB within this section. It is capable of over 30 dB gain control and automatic gain control range. The transistors utilized in this two stage units are rated at 3.5 dB noise figure at 200 MHZ.

CONVERTER The converter is also a two stage circuit. The first stage is another automatic gain controlled input channel amplifier. The second is a dual gate field effect mixer. A crystal oscillator provides injection to gate 2 which is the frequency difference between the received and transmitted channel. Overall gain including the input match attenuation is approximately 24 dB.

AMPLIFIER This two stage unit amplifies the transmitted channel about 30 dB including the input attenuation. It provides the required one to two volts peak visual output at 75 ohm for A.G.C. and demuting detection and to drive the final amplifier.

FINAL The two stage power amplifier provides approximately 26 dB further amplification and delivers up to 10 watts peak visual output. Both stages are biased at cutoff by the muting control circuit when there is no received signal.

### FIELD MAINTENANCE

No field alignment is ever required. The antennas, cables, and meter readings should be periodically checked.

The transistors will normally not deteriorate significantly during ten years use. Many of our earlier solid state units have operated for over twenty years without maintenance or failure.





It is good practice to record the input signal levels and all meter readings during the initial installation. This will help identify any loss of input signal or broken output cable connection at a later date.

If the power output is checked with an average reading meter, such as the Bird Types, keep in mind that visual transmitter are rated at their peak sync power. A ten watt translation will read only about five watts average with a 75 ohm Bird, and will fluctuate with video content.

Because of the mismatch, a 50 ohm average reading meter will indicate only about four watts when measuring a ten watt peak visual output from a 75 ohm translator.

Conversion frequency accuracy is easily checked on the TVT-10. Remove the rear interconnecting cable from the converter output and connect a 50 or 75 ohm frequency counter. Detach the receive (only) antenna and switch the power on. The frequency of the conversion injection will read on any accurate counter with a sensitivity of 20 millivolts.

The TVT-10 standard accuracy is .01% but up to .001% crystals are available upon special order at no extra cost. (Delivery time is increased 30 days for aging of the high accuracy crystals).

#### FACTORY SERVICE

For the first year after delivery, factory service is available at no charge for parts or labor, provided there has been no internal tampering of the translator, and no physical or lightning damage.

It is very unlikely that this service will be required. Should the TVT-10 be returned for any reason, please double box with protective inner cushioning on all sides and return by priority (air) mail. This is the fastest way, and is reasonable cost because of the light weight of the translator.

Thank you for choosing our equipment. We will do everything possible to assure your satisfaction.





## TVT - 10 SPECIFICATIONS

<u>POWER SOURCE</u>	12.6 to 14 volt D.C. One to 1.2 amp transmit. 100 ma. standby - muted.
<u>INPUT FREQUENCY</u>	Any V.H.F. T.V. Channel, including CCIR.
<u>OUTPUT FREQUENCY</u>	Any V.H.F. T.V. Channel not adjacent or harmonically related to input.
<u>INPUT SIGNAL</u>	50 microvolts to 50 millivolts, 75 ohms. ( Use optional attenuator above 5 millivolts) (Preamp recommended below 200 microvolts)
<u>OUTPUT SIGNAL</u>	Maximum, 10 watts peak visual, One watt aural. Minimum, 2 watts peak visual.
<u>R.F. IMPEDANCE</u>	75 ohm in and out (optional 50 ohm transformers and F adapters available)
<u>CONNECTORS</u>	Type F radio frequencies Banana jacks D.C. power
<u>CONVERSION ACCURACY</u>	.01% Standard, .001% optional
<u>SPURIOUS RADIATIONS</u>	-50 dB Typical, -40 dB Maximum
<u>HARMONICS</u>	-80 dB Typical, -70 dB Maximum
<u>METERING</u>	Supply voltage, Power output, Final current, Diode current, amplifier current, Converter current. Receiver current, Muting.
<u>GAIN CONTROL</u>	20 dB Manual, over 40 dB automatic with less than 1 dB output variation.
<u>SIZE</u>	3.5 x 6 x 8 inches, 9 x 15 x 20 cm.
<u>WEIGHT</u>	3.3 lbs., 1.5 kg.

